

JAN 17 2008

Application No.: 10/622,211

Docket No.: MWS-055RCE

**AMENDMENTS TO THE CLAIMS**

1. – 3. (Cancelled)

4. (Currently Amended) A method implemented in an electronic device that provides a block diagram environment, the method comprising:

providing a block diagram representing a multi-rate dynamic system, the block diagram having a plurality of systems, wherein a first group of systems process data at a first rate and a second group of systems process data at a second rate;

generating a first set of functions, the first set of functions being associated with the first group of systems to invoke said first group of systems implicitly therefrom;

storing the first set of functions in a storage device;

generating a second set of functions, the second set of functions being associated with the second group of systems to invoke said second group of systems implicitly therefrom; and

storing the second set of functions in the storage device.

5. (Original) The method of Claim 4, wherein the block diagram has one or more subsystems that process data at one of the first rate and the second rate.

6. (Previously Presented) The method of Claim 5, further comprising:

generating a set of sub-functions, the set of sub-functions being associated with the subsystems to invoke said subsystems implicitly therefrom.

7. (Currently Amended) A method implemented in an electronic device that provides a block diagram environment, the method comprising:

providing a block diagram representing a multi-rate dynamic system, the block diagram ~~including that includes~~ a block having functions defined in a mechanism outside of the block diagram;

identifying portions of the block by a rate of operation;

grouping code for the block into a plurality of functions, wherein there exists at least one function for each portion of the block identified; and

storing the grouped code in a storage device.

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8. (Original) The method of Claim 7, wherein the grouping of the code comprises sets of code statements free of logical predicates.
9. (Original) The method of Claim 7, wherein the mechanism comprises a selected programming environment.
10. (Original) The method of Claim 9, wherein the selected programming environment comprises a structured programming environment.
11. (Original) The method of Claim 9, wherein the selected programming environment comprises an object oriented programming environment.
12. (Currently Amended) A method implemented in an electronic device that provides a block diagram environment, the method comprising:
- providing a block representing an elemental multi-rate dynamic system, the block having two or more components that execute at different rates;
  - separating generated code for the block into two or more sets of code statements, with one set of code statements for each rate;
  - associating each of the sets of code statements with a corresponding one of the components of the block; and
  - storing each of the sets of code statements in a storage device.
13. (Original) The method of Claim 12, wherein the block performs one or more functions defined by a mechanism outside a context of a model in which the block operates.
14. (Previously Presented) The method of Claim 12, wherein associating each of the sets of code statements with a corresponding one of the components of the block based on rate performs an implicit association providing an unconditional execution path for each set of code statements.

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15. (Currently Amended) A method implemented in an electronic device providing a block diagram environment, for generating code from a multi-rate block diagram model representing a multi-rate dynamic system, the multi-rate block diagram having one or more sub-systems that include an elementary block having two or more operating rates, the multi-rate block diagram model performing a plurality of operations at a plurality of operating rates, the method comprising:

identifying the plurality of operating rates contained in the multi-rate block diagram model, wherein each block in the multi-rate block diagram model has one or more operating rates and each of the plurality of identified operating rates indicates a rate of an associated operation of one of the blocks in the multi-rate block diagram model;

generating code from the multi-rate block diagram model, the generated code having one function for each identified operating rate, wherein each of the functions provides implicit identification of one of the identified plurality of operating rates per groups of blocks in the multi-rate block diagram model;

generating code from the multi-rate block diagram model for the one or more sub-systems, the generated code having a sub-function corresponding to a selected one of the plurality of identified operating rates for the elementary blocks in the sub-systems and relate to the function for the selected operating rate, wherein the sub-function provides implicit identification of the selected operating rate per a subsystem of the groups of blocks; and

storing the generated code in a storage device.

16. (Original) The method of Claim 15, wherein each of the functions generated for each of the plurality of identified operating rates invokes only the blocks executing the rate to which the function corresponds.

17. (Currently Amended) A ~~device-computer~~ readable medium holding ~~device-computer~~ executable instructions for generating code from a multi-rate block diagram model representing a multi-rate dynamic system, the multi-rate block diagram model having one or more sub-systems that include an elementary block having two or more operating rates, the multi-rate block diagram model performing a plurality of operations at a plurality of operating rates, the medium comprising:

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instructions for determining from the multi-rate block diagram model the plurality of operating rates contained in the multi-rate block diagram model, wherein each block in the multi-rate block diagram model has one or more operating rates and each of the plurality of operating rates indicate a rate of an associated operation of one of the blocks in the multi-rate block diagram model; and

instructions for generating code from the multi-rate block diagram model, the generated code having one function for each of the plurality of operating rates, wherein each of the functions provides implicit identification of one of the plurality of operating rates per groups of blocks in the multi-rate block diagram model;

instructions for generating code from the multi-rate block diagram model for the one or more sub-systems, the generated code having a sub-function corresponding to a selected one of the plurality of identified operating rates for the elementary blocks in the sub-systems and relate to the function for the selected operating rate, wherein the sub-function provides implicit identification of the selected operating rate per a subsystem of the groups of blocks; and

instructions for storing the generated code in a storage device.

18. (Previously Presented) The medium of Claim 17, wherein each of the functions generated for each of the plurality of operating rates invokes only the blocks executing the rate to which the function corresponds.

19. – 21. (Cancelled)

22. (Currently Amended) A ~~computer device~~ readable medium holding ~~device computer~~ readable instructions, said medium comprising:

instructions for identifying from a block diagram representing a multi-rate dynamic system, a plurality of systems, wherein a first group of systems process data at a first rate and a second group of systems process data at a second rate;

instructions for generating a first set of functions, the first set of functions being associated with the first group of systems to invoke said first group of systems implicitly therefrom;

instructions for storing the first set of functions in a storage device;

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instructions for generating a second set of functions, the second set of functions being associated with the second group of systems to invoke said second group of systems implicitly therefrom; and

instructions for storing the second set of functions in the storage device.

23. (Previously Presented) The medium of Claim 22, wherein the block diagram has one or more subsystems that process data at one of the first rate and the second rate.

24. (Currently Amended) The medium of Claim ~~[[22]]~~ 23, further comprising:  
instructions for generating a set of sub-functions, the set of sub-functions being associated with the subsystems to invoke said subsystems implicitly therefrom.

25. (Currently Amended) A ~~device-computer~~ readable medium holding ~~computerdevice~~ executable instructions, said medium comprising:  
instructions for importing into a block diagram representing a multi-rate dynamic system,  
a block having functions defined in a mechanism outside of the block diagram;  
instructions for identifying portions of the block by a rate of operation;  
instructions for grouping code for the block into a plurality of functions, wherein there exists at least one function for each portion of the block identified; and  
instructions for storing the grouped code in a storage device.

26. (Previously Presented) The medium of Claim 25, wherein the grouping of the code comprises sets of code statements free of logical predicates.

27. (Previously Presented) The medium of Claim 25, wherein the mechanism comprises a selected programming environment.

28. (Previously Presented) The medium of Claim 27, wherein the selected programming environment comprises a structured programming environment.

29. (Previously Presented) The medium of Claim 27, wherein the selected programming environment comprises an object oriented programming environment.

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30. (Currently Amended) A ~~device-computer~~ readable medium holding ~~device-computer~~ executable instructions, said medium comprising:

instructions for selecting a block representing an elemental multi-rate dynamic system,  
the block having two or more components that execute at different rates;

instructions for separating generated code for the block into two or more sets of code statements, with one set of code statements for each rate;

instructions for associating each of the sets of code statements with a corresponding one of the components of the block; and

instructions for storing each of the sets of code statements in a storage device.

31. (Previously Presented) The medium of Claim 30, wherein the block performs one or more functions defined by a mechanism outside a context of a model in which the block operates.

32. (Previously Presented) The medium of Claim 30, wherein associating each of the sets of code statements with a corresponding one of the components of the block based on rate performs an implicit association providing an unconditional execution path for each set of code statements.

33. – 38. (Cancelled)